

## DISINFECTION BY-PRODUCTS SAMPLING PLAN GUIDANCE

### Location and Rationale

For most community and non-transient non-community systems in Vermont, a location for Disinfection By-Product (DBP) sampling that is representative of the maximum residence time (MRT) of disinfectant within the distribution system needs to be chosen. Typically, MRT of water within the distribution system can be found at dead-end areas, the edge of the distribution system, areas of low water usage, or areas of low flow. Areas of typically low residual disinfection levels in the distribution system can also indicate areas of MRT. Large systems using surface or groundwater under the direct influence of surface water (GWUDI) must also identify areas of average residence time (ART).

### Sample Number and Frequency

The number of DBP samples required to be collected under the Disinfection By-Product (DBP) Rule is based on the type of water used by the system and the system's population. Samples should be collected under normal operating conditions. Please refer to the following table to determine the number of DBP samples that must be collected under routine monitoring protocol:

Type of System	Population	Monitoring Frequency	Locations
Surface Water or GWUDI	$\geq 10,000$	4 samples per year per treatment plant	At least 25% at MRT with remaining samples taken at ART
	500-9999	1 sample per quarter per treatment plant	MRT
	$< 500$	1 sample per year per treatment plant during month of warmest temperature	MRT
Groundwater	$\geq 10,000$	1 sample per quarter per treatment plant	MRT
	$< 10,000$	1 sample per year per treatment plant during month of warmest temperature	MRT

For systems on annual monitoring, the DBP samples need to be taken during the warmest month of the year. The Drinking Water and Groundwater Protection Division considers a system to be in compliance with this requirement when sampling occurs within the third quarter (i.e., July 1 – September 30).

Additionally, under the DBP Rule free chlorine residual needs be measured and reported each time a coliform sample is taken. If free chlorine is not detectable, total chlorine must be measured and reported. Chlorine samples must be taken at the same time and location as Total Coliform Rule (TCR) samples as identified in your approved Bacteriological Sampling Plan. Chlorine samples are required not only for routine samples but also for any additional coliform samples (e.g., repeat and increased number of routine) required when total coliform was found to be present during routine monitoring.

### Sample Collection

Total trihalomethane and total haloacetic acid samples are collected in glass vials supplied by the laboratory. Specific instructions are included with the containers but following are some general guidelines:

1. Remove aerator and screen from faucet
2. Turn on cold water tap and allow to run until temperature stabilizes (3-5 min). Reduce flow to thickness of a pencil.
3. Remove cap from vial and fill completely (creating a meniscus) without overflowing being careful not to flush out preservative.
4. Recap the vial, invert a few times and inspect for air bubbles. If air bubbles are present, remove cap and fill so that there is no headspace.
5. Fill second and third vial following same procedure.

### Evaluating Your Results

An exceedance of the maximum contaminant level (MCL) for total trihalomethanes occurs when the running annual average for a system is greater than or equal to 0.080 mg/L (or 80 ppb). An exceedance of the maximum contaminant level (MCL) for total haloacetic acids occurs when the running annual average for a system is greater than or equal to 0.060 mg/L (or 60 ppb). For systems required to collect one sample per year, the results for that sample are considered the running annual average for that year.

An exceedance of the maximum residual disinfectant level (MRDL) occurs when the running annual average, computed quarterly, of monthly averages of all chlorine samples collected by the system is greater than 4.0 mg/L. To date, no systems in Vermont have exceeded this level.

If you exceed the MCL or MRDL you must issue public notice to your users. You will also have to monitor on a quarterly basis. The state will notify you in writing of these requirements.

This form and related environmental information are available electronically via the internet. For information visit us through the Vermont Homepage at <http://www.vermont.gov> or visit DWGWPD directly at <http://www.drinkingwater.vt.us>

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